

OPERATING INSTRUCTIONS FOR MODEL 314

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GENERAL

Model 314 is a versatile, free-point return tube tester. Its design is such that it enables the user to test any type tube, regardless of its filament voltage or base wiring. Flexibility is attained by using individual lever switches for each tube element. This in turn insures maximum protection against obsolescence.

IMPORTANT PRECAUTIONS

It is important that the operating instructions be read thoroughly before attempting to test any tube. Damage may be done to both the instrument and the tubes under test, if the proper sequence is not followed in using this tube tester. Particular care should be given to settings "A", "B", and "E" before inserting a tube into its appropriate socket. Control "A" determines the filament voltage applied to the tube under test. Should this control be set to a higher value than the tube is designed for, the filament of the tube will be damaged.

USE AS A TUBE TESTER

1. Before inserting tube to be tested.
 - A. Set "Line Voltage" control to "OFF" position.
 - B. Connect Line Cord to a suitable AC supply.
2. Refer to Roll Chart for the tube to be tested and:-
 - A. Set control "A" to the appropriate voltage as listed on the roll chart for tube to be tested.
 - B. Throw the proper lever switch as indicated in the roll chart under column "B" toward the "Filament Bus" position.
 - C. Adjust "Shunt Control" to reading listed under column "C" of roll chart.
 - D. Set control "D" marked "Circuit Selector" to "Line Volts".
3. Insert tube into proper socket.

Advance "Line Voltage" control clockwise until the meter pointer corresponds to the red line at mid-scale marked, "Line Check". Allow a minute for the instrument to warm up.

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4. Short and Leakage Test.

- A. Set control "D" marked, "Circuit Selector" to "Short".
- B. Throw the proper lever switches as indicated in the roll chart under column "E" toward the "Plate Bus" position. Throw only ONE switch at a time and return to the normal position before the following switch is thrown.
- C. While performing the above operation observe the neon glow lamp located on the panel. If this lamp should glow continuously or flash at regular intervals while a lever switch is thrown to the "E" position, the tube under test contains either a shorted element or undesirable leakage. Disregard any momentary flash that may appear as the lever switches are thrown, unless, these flashes reappear at regular intervals.
- D. Filament Continuity. Throw the lever switch indicated in the roll chart under column "B" toward the "Plate Bus" position. The neon lamp should glow. If it does not glow, the tube is defective, and no further tests should be made. Return lever switch to "Filament Bus" position before proceeding.
- E. Cathode Leakage. For cathode leakage test refer to a tube base wiring diagram. Throw the lever switch corresponding to the number of the cathode pin, to the "Plate Bus" position. The neon glow lamp should not glow. Tubes having filament voltages of 25 volts or higher will sometimes indicate a slight cathode leakage at the rated filament voltage. This is not objectionable in such tubes. To determine whether the tube is actually shorted or not, the "Filament Voltage" setting should be reduced to 12.6 volts. If the glow persists at the reduced filament voltage, the tube should be rejected as defective. Should the glow disappear, at the reduced filament voltage, the tube is not shorted and can be considered good. Should the tube have more than one cathode, repeat the same procedure for each cathode. Before performing the Quality Test return the Filament Voltage control to the normal voltage as indicated on the roll chart under column "A", and reset the switch representing the cathode to the "Normal" position.

5. Quality Test.

- A. Set Control "D" marked "Circuit Selector" to position indicated on the roll chart under column "D".
- B. Throw the proper lever switches as indicated in the roll chart under column "E" toward the "Plate Bus" position. Throw All the switches as indicated on the chart to the "E" position at the same time.
- C. The meter will indicate whether a tube is "GOOD" or "POOR".
- D. "Circuit Selector" on "K" position. When the "Circuit Selector" is on the "K" position the tube is good if the meter reads beyond the portion of the scale marked, "Diodes OK".
- E. More than one listing. If more than one listing appears for the same tube, this indicates that the tube is of the multi-purpose type. Repeat the procedure as outlined in Paragraphs 4 and 5 for each listing.

6. Noise Test.

- A. After completing the "Quality Test", return the lever switches indicated in column "E" of the roll chart to the normal position.
- B. Advance "Shunt Control" to 100.
- C. Insert an earphone with a plug attachment to the phone jack marked "Noise".
- D. Repeat the operation described in Paragraph "4B".
- E. As each lever switch is thrown a hum will be heard in the earphones. This hum should not vary nor should any clicks be heard when the tube under test is tapped with the fingers. Should clicks be heard, the tube has a noisy element.

7. Ballast Tubes.

In a large number of instances the type designation stamped on the ballast tube indicated the value and circuit arrangement of the unit. As an example, let us select one of the commonly used types such as the "BK55B"

The first letter "B" indicates that a ballast section for one or more pilot lamps is used.

The second letter "K" in the above example, indicates the current rating of the pilot lamp.

The number "55" (or any number used in the same location) gives the total voltage drop across the resistance.

The final letter "B" indicates the circuit arrangement or base wiring. The most popular type base wiring and the corresponding settings will appear in a table below. It is this final letter just discussed that determines the settings for testing a ballast tube. None of the

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other letters or numbers have any bearing on the test.

- A. Set "Filament Voltage" Control to the "BAL" position.
- B. Set the "Circuit Selector" control to the "Short" position.
- C. Return all lever switches to the "Normal" position.
- D. Insert the ballast tube into the socket.
- E. Throw the lever switches to the "Plate Bus" position, one at a time, as indicated by the table below.
- F. The neon glow lamp should glow as each lever switch is thrown to the "Plate Bus" position. Failure to glow indicates that a section of the ballast is open and therefore the tube is defective.

Ballast tubes are commonly constructed with two different type bases, the UX 4 Prong Base, and the Octal 8 Prong Base. Use the appropriate settings in accordance with the base of the ballast tube under test.

<u>Last Letter</u>	<u>UX 4 Prong</u>	<u>Octal 8 Prong</u>
A	1,4	3,7
B	1,3,4	3,7,8
C	1,3,4	3,7,8
D	1,2,3,4	2,3,7,8
E		2,3,5,7,8
E ₁		3,7,8
F		2,3,7,8
G		2,3,7,8,
H		1,2,3,7,8
J		1,2,3,5,7,8

Should the ballast tube under test not be coded in accordance with the standard RMA code as outlined above, it will then be necessary to secure a base diagram of the ballast tube and depress the lever switches which correspond to the terminals listed on the base diagram.

Note "A"

Special Instructions for Tuning Indicators.

In addition to a quality or emission test of cathode ray tuning indicators it is possible to visually check the operation of the tube under operating conditions. The settings for all cathode ray tuning indicators are given in the following list.

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- a. Adjust the "Shunt Control" to 100.
- b. Set Control "D" marked "Circuit Selector" to "N".
- c. Set Controls "A" and "B", "Filament Volts" and "Filament Bus" to readings as indicated on the roll chart for the tuning indicator under test.
- d. Throw the lever switches to the "E" position as shown on the following list.

<u>Tube Type</u>	<u>Tuning Eye Open</u>	<u>Tuning Eye Closed</u>
2E5	4	2,4
2G5	4	2,4
6AB5	4	2,4
6AD6(Section 1)	5	3,5
6AD6(Section 2)	5	4,5
6AF6(Section 1)	5	3,5
6AF6(Section 2)	5	4,5
6E5	4	2,4
6G5	4	2,4
6H5	4	2,4
6N5	4	2,4
6T5	4	2,4
6U5	4	2,4

GUARANTEE

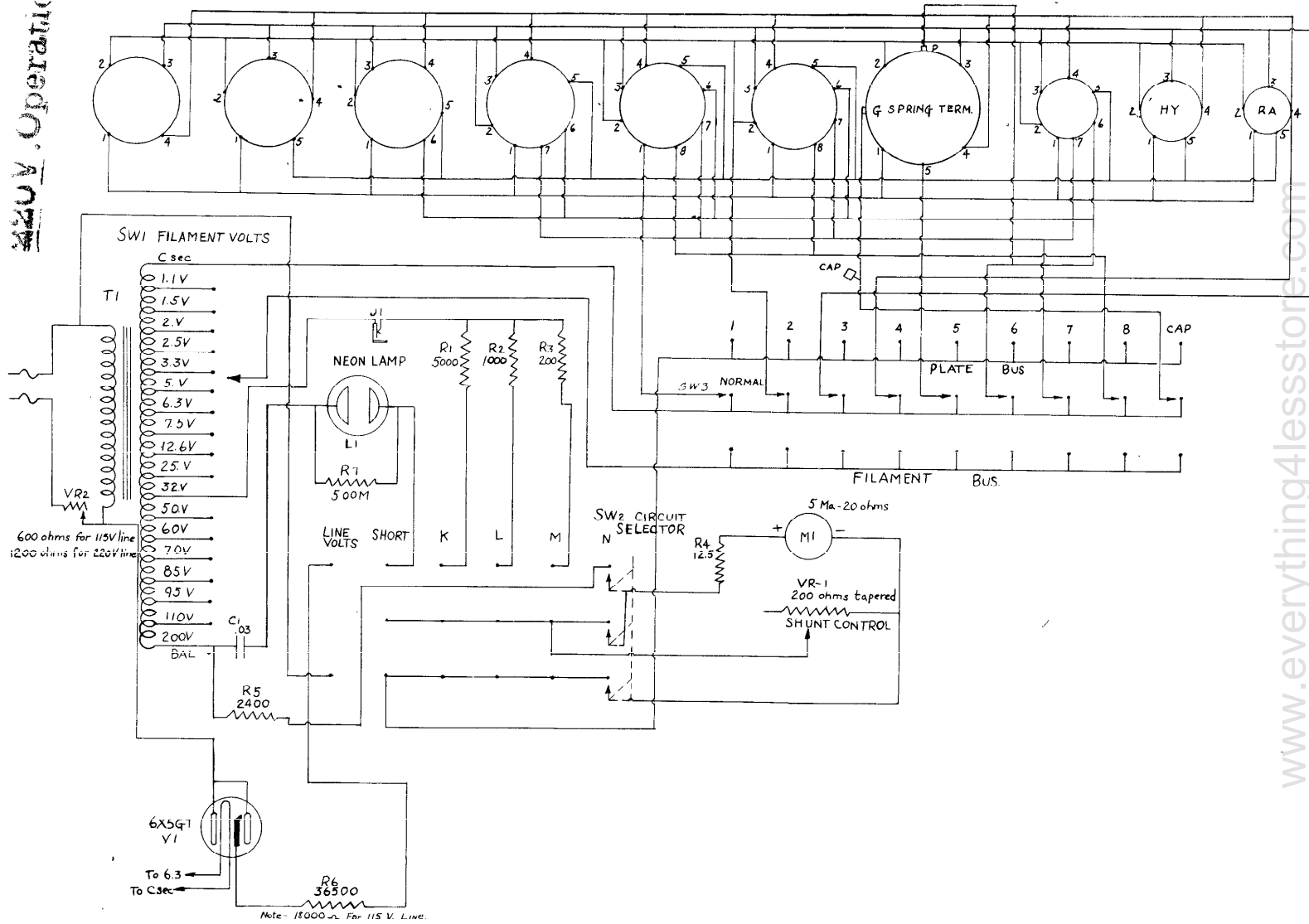
This instrument is guaranteed to be free from and defect in material and workmanship that may develop within a period of 90 days from the date of purchase under the terms of the standard RMA guarantee. Any part or parts that prove defective within this period will be replaced without charge when subjected to examination at our factory, providing such defect is, in our opinion, due to faulty workmanship or material, and not caused by tampering, abuse or normal wear.

Radio City Products Company, Inc. reserves the right to make changes in design or add improvements to instruments manufactured by them without incurring any obligation to install such changes or improvements in any instrument previously purchased.

Radio City Products Company Inc.
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New York 1, N. Y.

PARTS LIST FOR MODEL 314

Part No.	Circuit Symbol	No. Req'd	Description	Name
314-1	M 1	1	5 ma - 4-1/2" square - 0-20 ohms	Meter
8	T 1	1	Filament Transformer	transformer
4	SW 2	1	Circuit Selector Switch-27119-E2	switch
5	VR 2	1	line Voltage Control - 1200 ohms for 210 V line, 600 ohms for 115 V line	rheostat
6	VR 1	1	Shunt Control-200 ohms tapered E 7094	rheostat
7	SW 1	1	Filament Switch 1 pole 18 position	switch
9		1	Pilot lite socket-miniature screw base	socket
10		1	6 volt pilot lite - T 40	lite
10A		1	Neon lamp socket-candelabra screw base	socket
13	J 1	1	closed circuit phone jack-I J102	phone jack
14		1	Complete rollindex unit with roll chart	roller
16		1	Grid cap lead	cap
17		1	Insulated caps for Acorn Tubes with 6" leads	caps
18	SW 3	9	Lever Switches 1 pole 3 position	lever switch
15		4	bar knobs - black bakelite	knobs
30		1	Double fused plug for line cord	plug
32		2	1 amp fuses for line cord	fuse
33	C 1	1	.03 mfd-400 volt paper tubular condenser	condenser
34	R 6	1	pair BT 1/2 matched in series to 36,500 $\pm$ 1%	resistor
35	R 3	1	200 ohms - 5 watt - VW	resistor
36	R 2	1	1000 ohms - 1 FY - 2-1/2%	resistor
37	R 1	1	5000 - BT 1/2 - 5%	resistor
38	R J	1	2400 - 10 watt - VW	resistor
42	V 1	1	6 x 5 G T Tube	tube
46	R 4	1	12.5 ohms - 1/2 FX - 2-1/2%	resistor
47	L 1	1	neon lamp - N 1 - 1/10 watt	lamp



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